Notice of Allowability	Application No.	Applicant(s)
	10/647,060	MEARS ET AL.
	Examiner	Art Unit
	Thinh T. Nguyen	2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *5/3/2005*.

2. ☒ The allowed claim(s) is/are *1-71*.

3. ☒ The drawings filed on *22 August 2003* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

David Nelms
Supervisory Patent Examiner
Technology Center 2800

DETAILED ACTION

Reason for allowance

1. Claims 1-71 are allowed. The following is an examiner's statement of reason for allowance:

I/ Group I: Claims 1-20:

None of the references of record teaches or suggests the claimed **SEMICONDUCTOR DEVICE INCLUDING BAND-ENGINEERED SUPERLATTICE** having the limitations:

--" each group of layers of said superlattice comprising a plurality of stacked base semiconductor monolayers defining a base semiconductor portion and an energy band-modifying layer thereon;

said energy-band modifying layer comprising at least one non-semiconductor monolayer constrained within a crystal lattice of adjacent base semiconductor portions so that said superlattice has a higher charge carrier mobility in the parallel direction than would otherwise be present. "--

and all other limitations as recited in claim 1.

II/ Group II: Claims 21-34:

None of the references of record teaches or suggests the claimed **SEMICONDUCTOR DEVICE INCLUDING BAND-ENGINEERED SUPERLATTICE** having the limitations:

--" each group of layers of said superlattice comprising a plurality of stacked silicon monolayers defining a silicon portion and an energy band-modifying layer thereon; said energy-band modifying layer comprising at least one oxygen monolayer constrained within a crystal lattice of adjacent silicon portions so that said superlattice has a higher charge carrier mobility in the parallel direction than would otherwise be present. "--

and all other limitations as recited in claim 21.

III/ Group III: Claims 35-45:

None of the references of record teaches or suggests the claimed **SEMICONDUCTOR DEVICE INCLUDING BAND-ENGINEERED SUPERLATTICE** having the limitations:

--" each group of layers of said superlattice comprising less than eight stacked base semiconductor monolayers defining a base semiconductor portion and an energy band-modifying layer thereon; said energy-band modifying layer comprising a single non-semiconductor monolayer constrained within a crystal

lattice of adjacent base semiconductor portions so that said superlattice has a higher charge carrier mobility in the parallel direction than would otherwise be present. "--

and all other limitations as recited in claim 35.

IV/ Group IV: Claims 46-52:

None of the references of record teaches or suggests the claimed **SEMICONDUCTOR DEVICE INCLUDING BAND-ENGINEERED SUPERLATTICE** having the limitations:

--" regions for causing transport of charge carriers through said superlattice in a parallel direction relative to the stacked groups of layers; each group of layers of said superlattice comprising less than eight stacked silicon monolayers defining a silicon portion and an energy band-modifying layer thereon; said energy-band modifying layer comprising a single oxygen monolayer constrained within crystal lattice of adjacent silicon portions. "--

and all other limitations as recited in claim 46.

V/ Group V: Claims 53-71:

None of the references of record teaches or suggests the claimed **SEMICONDUCTOR DEVICE INCLUDING BAND-ENGINEERED SUPERLATTICE** having the limitations:

--" each group of layers of said superlattice comprising a plurality of stacked base semiconductor monolayers defining a base semiconductor portion and an energy band-modifying layer thereon; said energy-band modifying layer comprising at least one non-semiconductor monolayer constrained within a crystal lattice of adjacent base semiconductor portions so that said superlattice has a lower conductivity effective mass in the parallel direction than would otherwise be present. "--

and all other limitations as recited in claim 53.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance".

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790. The examiner can normally be reached on Monday-Friday 9:00am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached at 571-272-1787. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9319 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [PAIR] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thinh T Nguyen TTN

Art unit 2818

David Nelms
Supervisory Patent Examiner
Technology Center 2800